LIFE SCIENCES WORKSHOP

Welcome & Charge to Participants

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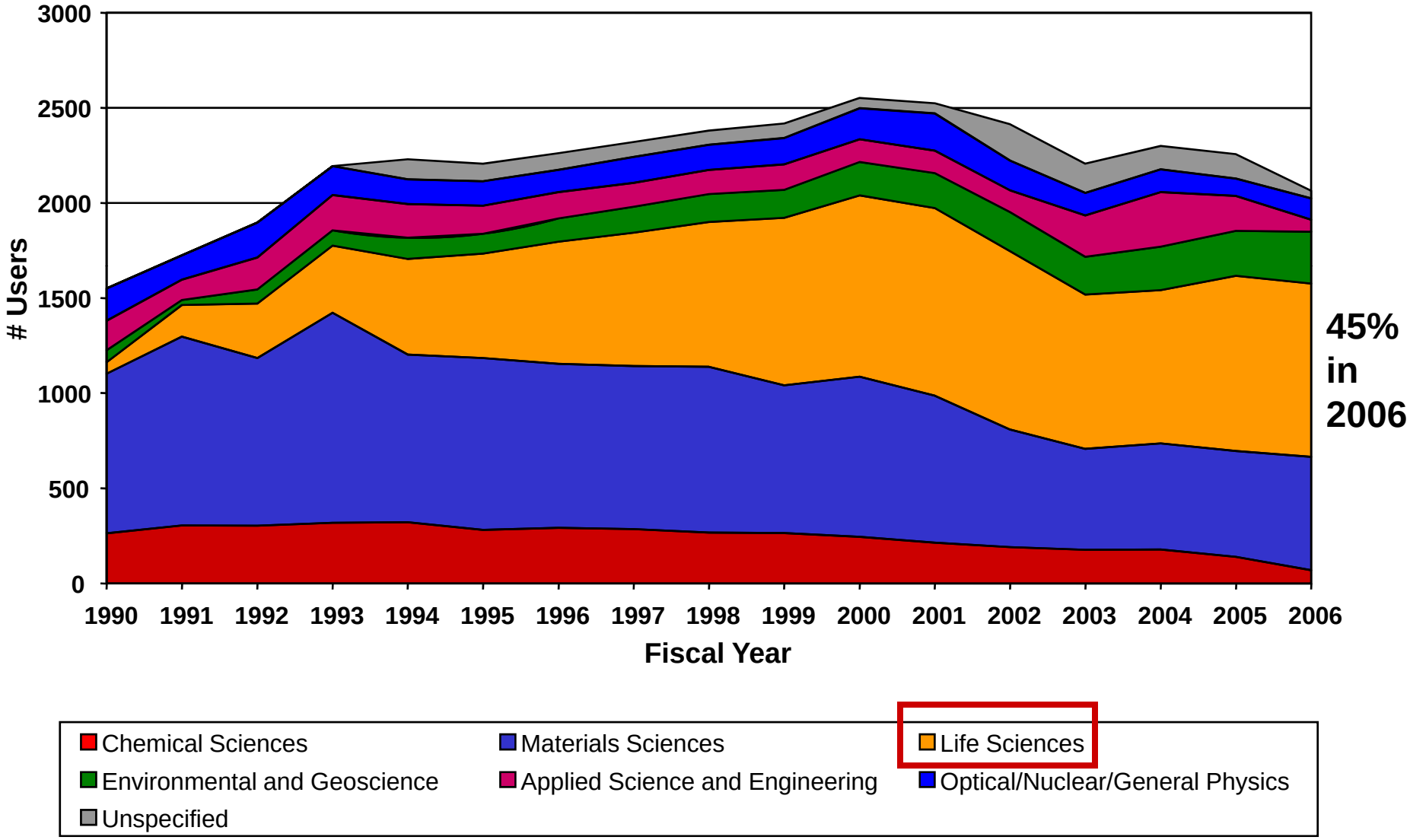
Life Sciences Community at NSLS



Goals of this Workshop

1. Short-term planning for the growth and expansion of current NSLS programs
   - For world-class science today
   - For the transition to NSLS-II

2. Discuss the vision of life sciences for NSLS-II
   - What beamlines and facilities will we need?
   - How will we minimize the impact on the community during the transition?

Workshop Strategy

Life Sciences "Village" Environment

Structural/Molecular Biology:
For the same protein or complex:

- small-angle x-ray scattering: low-resolution structure, static & dynamic
- EXAFS: metal active site environment, static & dynamic
- MX: atomic-resolution structure, static & dynamic

Chemical/Structural Imaging:
In a single biological cell:

- infrared imaging: chemical imaging of biological cells
- full-field, soft x-ray TXM: nanoscale 3D sub-structure
- x-ray spectromicroscopy: 3D nanoscale chemical imaging of organic components
- x-ray fluorescence microprobe: 3D trace element mapping

To promote synergy between life sciences users
and explore interactions with other communities

Building a Life Sciences Village Environment

Multidisciplinary Research

- Include related synchrotron disciplines: enviro, soft matter, biophysics
- Include non-synchrotron techniques: Vertically integrated research laboratory with facilities for cell growth, macromolecule purification, crystal growth, and characterization by other methods than light-based ones – NMR, mass spectrometry, and electron microscopy.

Building a Life Sciences Village Environment

Adjacent Sectors and a Laboratory-Office Building (LOB)

- Align life sciences beamlines on adjacent sectors for strong scientific interactions
- Identify funding and construct a laboratory-office building (LOB) for life sciences staff and users

Building a Life Sciences Village Environment

Structural Biology & Imaging Research Center

Something like the Partnership for Structural Biology at ESRF

http://psb.esrf.fr/

Building a Life Sciences Village Environment

Development Research

- Create long-term funding for personnel in Joint Photon Science Institute (J-PSI) building.
- Could improve x-ray detectors, x-ray optical systems, and automated systems for specimen manipulation.

Deliverable of this Workshop

A white paper that will be submitted to:

1. NSLS management for short-term scientific planning and preparation for the transition to NSLS-II
2. NSLS-II management as a vision for life sciences at the new facility

Topics to be discussed:

- The Growth, Expansion, and Transition of NSLS Scientific Programs
- Proposed Suite of Beamlines
- Beamline Specifications and R&D Needs
- Recommended Transition/Construction Sequence
- Facility Infrastructure at NSLS-II
- Synergy with other Communities

Workshop Format

Tuesday

- Introduction to NSLS-II & Process for Building Beamlines (John Hill)
- Current (& Future) Techniques
    - Structural & Molecular Biology
    - Chemical and Structural Imaging
- Laboratory-Office Building (Vivian Stojanoff)
- Breakout Sessions for individual techniques

Wednesday

- Group (synergy) discussions (topics TBD)
- Report writing

Some Logistics

Workshop location:

- Tuesday: Berkner Hall Rooms A – D
- Wednesday: Biology Conference Room (Bldg 463)

Meals:

- Tuesday / Wednesday breakfast: provided
- Tuesday lunch: $10 lunch ticket in folder, good for today only
- Tuesday dinner: informal, no-host dinner at Phil's in Wading River

Breakout sessions:

- Be sure to sign up prior to lunchtime today (first and second choices)
- Will run from 3:30 – 5:30 pm in Berkner Rooms A, B, C, and D
- Topics for discussion provided to session leaders

Breakout Sessions

3:30 – 4:30 pm

- Structural/Molecular Biology – Berkner Room B
  - MX, SAXS, XAS, X-Ray Footprinting, CD
- Chemical/Structural Imaging – Berkner Room A
  - IR, STXM, XRF Microprobe, Diffraction Imaging, DEI/MRT

4:30 – 5:30 pm

- MX – Berkner Room B
- SAXS – Berkner Room D
- XAS, X-Ray Footprinting, CD – Berkner Room C
- IR, STXM, XRF Microprobe, Diffraction Imaging, DEI/MRT – Berkner Room A